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Report of Silicosis in Jhabua, Madhya Pradesh

Oct 2006- Jan 2007

Report prepared by Shilpi Kendra, Indore[1]
2006 - 2007

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Survey Report of Silicosis in Jhabua, M.P.

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SUMMARY

- Survey conducted in 21 villages of Alirajpur Tehsil of Jhabua District. 218 households, 489 persons had a definite exposure to silica dust of varying intensity and duration.
- Of the 489 persons who were exposed to silica dust for varying periods;158 are dead and 266 ill i.e. 86 % (424) are either ill or dead.
- Out of the total 489 persons surveyed 266 are still surviving and sooner or later they will die because of the fatal nature of the disease and necessary steps for their formal diagnosis as required for compensation by designated authority have to be taken urgently.
- Persons affected are prime breads winners of family. Majority (92%)of persons affected are in age group of 15-50 years.
- There are 70 children below the age of 18 who were affected out of whom 31 have died due to silicosis.
- 5 villages of Alirajpur tehsil have suffered maximum deaths i.e. Dhayana(38), Rordha(25), Bolwat(23), Malwai(21) and Ghongsa(18) making a cumulative total of 125 deaths. Bolwat and Malwai are very small villages having population less than 1000.
- Three factories viz Gayatri, Jyoti, Kumar have been responsible for maximum number of illness and deaths totaling to 159 out of 266 ill and 128 out of 158 deaths.
- Most of the deaths i.e. 94%(149 deaths) have occurred with less than 3 years exposure and therefore are acute silicosis.
- 118 persons (33.8%) have reported spending Rs 5000- Rs 10000 for their illness. 64 persons had to spend more than Rs 50000/- on their illness.

1. Introduction:

Occupational safety and health is a neglected issue despite the fact that rapid industrialization places a risk on the working population and chief among them is air pollution. Death and disease caused by air pollution is preventable.

Pneumoconiosis is one of the commonest and the most widespread occupational disease which causes high morbidity and mortality. It had been defined as, *"accumulation of dust in the lungs and the tissue reaction due to its presence"*[2]. Pneumoconiosis can broadly classified into *non-fibrogenic* and *fibrogenic* depending upon the character of the dust and the reaction it produces in the lungs. The most dangerous and fatal form of Pneumoconiosis is that caused by fibrogenic dust *viz* silicosis and asbestosis. This type of dust causes a fibrous reaction in the lungs of moderate to maximal degree, permanent scarring of the lungs and destruction of the alveolar architecture.

Asbestosis is a fibrotic (Scar producing) lung disease caused by inhalation of asbestosis fibres. Scarred lung tissue does not expand and contract normally, and cannot perform gas exchange. The severity of the disease depends upon the duration of exposure to asbestos and the amount inhaled. Asbestos exposure occurs in asbestos mining and milling industries, construction, fire-proofing, ship-breaking and other industries Symptoms include Shortness of breath on exertion, Cough, tightness in the chest, Chest pain ,Nail abnormalities ,Clubbing of fingers etc. There is no cure available. Stopping further exposure to asbestos is essential. The outcome depends upon the duration and extent of the exposure. Patients who develop malignant mesothelioma have a poor probable outcome, with 75% of those

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[2]Fourth international Pneumoconiosis Conference: working party on the definition of Pneumoconiosis report. Geneva, 1971.

[3] www.nlm.nih.gov/medlineplus/ency/article/003075.htm

affected dying within 1 year. Complications like Malignant mesothelioma and Pleural effusion occur.

Silicosis[4] is a fibrotic lung disorder caused by inhalation, retention and Pulmonary reaction to crystalline Silica a major portion of earth's crust and exposure occurs during mining, stone crushing and quarrying. Most common form of silica is quartz and silica particles, as small as 0.5 to 5 micron, are of respirable size. Exceptionally high exposure can cause silicosis within months with significant impairment of the lungs occurring within a few years.

As per the **ICMR report**[5] there are about 30 Lakh workers in India who are at high risk potential risk of exposure to silica employed in various occupations - 17 lakhs in mining/quarrying, 6.3 lakhs in glass and mica, 6.7 lakhs in metals.In addition 53 lakhs construction workers are also at risk of silica exposure.

Silica is one of the most fibrogenic materials in nature. It causes cascade reaction in the lungs and causes destruction of alveolar architecture and scarring of lungs.

__Quartz Crushing:__ Quartz is the most common mineral on the surface of the Earth. Quartz mineral is composed of SiO_2 Ore for silicon, glassmaking, frequency standards, optical instruments, silica source for concrete setting, filtering agents as sand.

Quartz Crushing is essentially a dry process. Large stones are first broken by hammer into smaller stones of 6' diameter outside the factories, they are then fed into jaw crushers manually which crush them into pebble size. These stones are then taken by conveyor belts to the Disintegrator where stone is milled into powder. From there it is automatically deposited into mechanical sieve of varying sizes. This enables the powder

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[4] www.nlm.nih.gov/medlineplus/ency/article/000134.htm

[5] ICMR Report-ISSN 0377-4910 Vol-2 No9, Sept 1999.

of different sizes to be separated. It is then collected into bags. The coarse powder is again thrown back into the machine mechanically. Large quantity of dust is generated during the process of crushing and disintegration of stone and also during the process of weighing and bagging the powder. Most of the work carried by the workers involves a heavy physical labour leading to deep and rapid breathing. which causes greater penetration of fine airborne dust deeper into the lungs. Quartz Crushing is one of the few industries where there is an exposure of the workers to almost 100% free silica dust in its finest form.[6]

Quartz crushing units in Panchmahal region were established in 1972. As per information obtained quartz crushing units are mainly located in Godra and Balasinore .More than 450 units of similar industry are located in Bewar,Jaipur and Bhilwara (Rajasthan.)[7]

2. Occupational Health situation in India

Occupational safety and health practice started off with injuries and accident reporting and prevention. Figures are unavailable for occupational hazards as well as for the number of workers exposed to specific hazards. The statistics published by the Labour Bureau do not show these. The system of occupational health surveillance is yet to develop. The number of occupational diseases reported is abysmal. The number of diseases reported in

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[6] Evaluation of Health Hazards In Quartz Crushing Industry and evaluation of Dust control measures, NIOH, Ahmedabad, H.N. Saiyed et al April 1982-March,1984.

[7] Presentation of Sh Habib Bhai, President of Panchmahal Minerals Manufacture Association, Godhra. before the committee on silicosis.

1978 was just 19, which climbed to 84 in 1982. There is no pattern or trend visible in the reported diseases. Benzene poisoning, halogen poisoning, silicosis and pneumoconiosis, byssinosis, chrome ulceration, lead poisoning, hearing loss and toxic jaundice are the conditions reported most frequently.

In India's industrialized zones, health problems linked to occupational hazards and workplace conditions affect many workers, while others are at risk from industrial accidents and their environmental effects.

From WHO declaration on Occupational health - 1994 - According to the best available estimates 100 million workers are injured and 200 000 die each year in occupational accidents and 150 million new cases of occupational disease are attributed to hazardous exposures or workloads. Such high numbers of severe health outcomes contribute to one of the most important impacts on the health of the world's population. Occupational injuries and diseases play an even more important role in developing countries where 70% of the working population of the world lives. By affecting the health of the working population, occupational injuries and diseases have profound effects on work productivity and on the economic and social well-being of workers, their families and dependents. According to recent estimates, the cost of work-related health loss and associated productivity loss may amount to several per cent of the total gross national product of the countries of the world.

ISSUE OF COMPENSATION[8]

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[8] Extracted form article "Social Security for workers in India: Some Ground realities pertaining to OSH by Jagdish Patel et al in the book Struggle for *Destined to die - Survey report of Silicosis in Jhabua.*

In India compensation for injuries and occupational diseases is covered mainly by two laws Workmen's Compensation Act,1923 (WCA) and Employees' State Insurance Act,1948 (ESI).

For claiming compensation under the WCA a worker has to approach the labour courts with the compensation commissioner and it is a very long drawn process generally taking many years. In many cases the errant employers are even able to bypass the awards of the court. The maximum compensation admissible in this as of now is Rs 456000 in case of death and Rs 548000 in case of permanent disablement. Most workers loose the long battle even loosing their jobs or are never able to go to court. In 1999 compensation received for fatality was only by 1023 persons, for permanent disablement by 1557 persons and temporary disablement by only 8747 persons.

ESI Act is applicable only to only those areas specifically notified by Govt and many areas are not covered by the Act. Within the notified areas, it covers all the factories using electric power and employing 10 or more workers and 20 or more for non-power units. Under the scheme workers pay 1.75 % of earnings and employers pay 4.75% of total wage bill. Employees earning less than Rs 40 a day are exempt from contribution. Under the various benefits the workers and their families are entitled to get 50% of wages as sickness benefits, 75% of wages as disablement benefits until treatment and in case of death the dependents get benefits- Dependent and Funeral Benifits. Upto year 2000, ESI Corporation has a saving of Rs. 5600 crores but very less compensation are given because of lengthy and time taking procedures. On an average annually only 700-900 dependents are compensated due to deaths of the workers.

Justice :Workers Compensation systems in Asia Pacific Region, jointly published by Asia Monitor resource Centre Ltd and ANROAV, March2005.

3. Socio-economic Profile of Jhabua district of Madhya Pradesh

Madhya Pradesh as its name implies, is located at the geographical center of India with Bhopal as the Capital. It shares its areas with five states, viz. Maharashtra, Gujarat. Rajasthan, Uttarpradesh, Chhattishgarh. Erstwhile Madhya Pradesh was the largest Indian state in terms of area (spreaded over 443,000 sq. kms), and had accounted for 14% of India's land mass. Even after bifurcation of the Chhattishgarh, Madhya Pradesh remains the second largest state and contributes 9.38% (308,245 areas sq. km.), to the country's total area of 3,287,263 sq. km with 45 districts. Agriculture continues to be the main stay of the economy of the state.

According to 2001 census Madhya Pradesh had a population of 60,385,118(male 314,568,73. female 28,928,245). The number of females per 1000 males was 920 in 2001.

According to 1991 census, the proportion of the total population designated as Schedule Caste (SC) was slightly lower in Madhya Pradesh (14%) than all of India (16%). The state, however, had the highest population of Schedule Tribes (ST) 23% population in the country excluding north-Eastern states. The ST population in the state increased from 20% of total population in 1971 to 23% in 1991.

The literacy rate of the state is 64.11% compared to 44.20% in 1991 of undivided Madhya Pradesh. Madhya Pradesh has made a good progress in literacy over the previous census of 1991.

In the development sector, delivery of effective public health services is one of the most dominating challenges facing Madhya Pradesh today. Several national level evaluations have

shown MP along with Orissa are the two states that have poor health indicators. Life expectancy at birth in Madhya Pradesh was 55.2 years for the period 1992-96. But this is far behind the national life expectancy of 60.7. In the state also there is a difference in life expectancy between rural and urban areas, which is 53.7 years and 63 years respectively. The crude infant child mortality in Madhya Pradesh is 88 persons per thousand. The fertility rate in Madhya Pradesh for 1997 was 4.0 much higher than national total fertility rate (TFR) of 3.3 and the maternal mortality rate was 498 deaths per 1,00,000 live birth according to SRS in 1999. The common health problems, affecting the state, are diseases like malaria, TB, leprosy and acute respiratory infections, diarrhea and fever. Being afflicted with diverse health problems, private health care centre in the state have mushroomed rapidly in a bid to cover the entire state. The state had 36 district hospitals, 57 civil hospitals and 313 Janpad Blocks in 2001. The state also had 8835 sub centres, 1194 primary health centres. But these were far less than the actual requirement. Moreover for the people to come to these health care centres they had to walk an average of 4 Kms.

District Profile:

Jhabua district is named after its headquarters town, Jhabua. The town was also the headquarter of the erstwhile Rathor state of Jhabua. The District is located in the extreme south-western part of Madhya Pradesh . It occupies the hilly tract along the western margin of Malwa plateau and north of Narmada river.

Jhabua was one of the smallest district in the erstwhile Madhya Pradesh. The total geographical area of the district is 6781 Sq. Km. The district was ranked in 21st position in the state in term of population size which is 2.31% of state total population. The total population of the district was 13,96,677 in 2001, in which

a significant proportion of the population in the district belongs to Schedule Tribes like, Bhil, Bhilala, Barela, etc. The sex ratio of the district was 990 while the density was 206 persons per sq. km. of area in 2001.

There are 6 towns and 1325 villages in the five tehsil of the district. From all the tehsil maximum numbers are in Jhabua(348) and Alirajpur (339). The general tendency of urbanization found in other district is lacking in Jhabua. People go in search of employment to nearby town to sell all their forest products, but do not stay there permanently for want of full time job opportunities.

The district is also behind the state average in the vital literacy standards. As against the state average 64.11 in 2001 the district had a poor literacy percentage of only 37.8% (male 48.75 and female 25.50).

Health Care Status of Jhabua District:

The life expectancy was 55.8 in 1991 and infant mortality was 130 and crude birth rate in the district was 45.4 in 1991. The diseases most common in the district are those of the digestive and respiratory system, malarial and typhoid, disease of eyes and skin and TB. Apart from these, the epidemics of cholera, small pox and influenza were also prevalent in varying degree in the district.

The district has two hospitals and six dispensaries, twelve Public Health Centers and 25 Government Ayurvedic dispensaries. In addition there were 121 registered midwives, 53-registered vaccinator and 12 family welfare clinic. A chief medical officer heads the only civil hospital at Alirajpur and it is under the control of civil surgeon at stationed at Jhabua. The poor health delivery system and lack of proper infrastructure compound the people and lead to a vast number of infant and premature death. This is

aggravated by lack of proper communication system, which is made difficult due to its difficult terrain topography.

The livelihood of the adivasis in the area is largely a subsistence economy based on agriculture which is substituted with income from livestock and forest produce.

4. Objective and Rationale of Study:

Rationale:

Even though people of Jhabua District have been dying since the last 6-8 years by silicosis but the issue came to light initially when KMCS, Alirajpur and Chuta Mazdoor Union, Thandla started highlighting the issue.They held rallies, petitioned the Government and took it out in the media.On 20-5-05 Danik Avantika took out a detailed news report on this issue titled as "Jhabua Jile se agyat Bimari se 85 logon ki Maut"-(Death of 85 persons in Jhabua District because of unknown illness)

Both these organizations conducted a detailed survey in the villages of their respective areas (viz-Alirajpur, Thandla and Meghnagar) and Dist hospital. A camp was organized in Alirajpur by Civil Hospital in 2005 where many persons were diagnosed as silicosis cases.The doctor notified the findings to the Tehsildar and the SDM but no action was tqken.

Despite all these efforts, no systematic study was there and it was difficult for the govt. and as well with the local organisations to identify the persons affected with silicosis in the area. In this investigation we had collected information with the support of Khedut mazdoor chetna sanghatan .

This study has been done keeping in mind that the problem of silicosis in Jhabua has been ignored by administration despite its producing such high fatality rate. The premier organization working in this field like NIOH[9], GPCB, MPPCB, CPCB, ISAH etc who have been doing surveys for the last 20 years on dust pollution restrict their surveys to vicinity of factories located in Gujarat and the workers who are found in the premises. Most of the workers who work in the factories are migrant workers from the Tribal belts of bordering states of MP,Rajasthjan, Maharashtra and even Gujarat villages.

No attempt has ever been made since 1980 from the time the first survey of NIOH to follow-up this problem in the villages. **Unfortunately, once a person has contracted the disease, it progresses even without further exposure to silica.** In a large number of workers symptoms have appeared only after going back to their villages.

What is seen in the currently working factory labourers is only the tip of the iceberg. Large bodies of labourers are dead and dying in the remote villages in oblivion.

Objective The objectives of the study were:

- To document the extent of spread of silicosis, and process of its causation.

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[9] NIOH-National Institute of Occupational Health, Ahemedabad.
GPCB-Gujrat pollution Control Board., Vadodara.
MPPCB- MP Pollution Control Board., Bhopal.
CPCB- Central Pollution Control Board, New Delhi.
ISAH- Industrial Safety And Health, Vadodara.

- To highlight the socio-economic impact the disease is producing on the families and the entire village.
- To pressurize the Administration to provide relief in the form of compensation and employment to affected persons and the families and take punitive action against factories.

5. Coverage & Methodology

The Silicosis problem from Gujarat factories is thought to be affecting 5 Blocks of Jhabua, 2 blocks of Dhar,(M.P.), Dist Banswara (Rajashtan), District Panchmahal (Gujarat).[10]

Since the study was aimed at stimulating the concerned Govt. agencies and the civil administration from their deep slumber and wake up to the extent of the problem attempt was made to cover as wide as area as was possible within our limited resources. We could restrict our survey only to the areas where Khedut Mazdoor Chetna Sangathan had its presence that in Alirajpur Tehsil. In all 21 villages were covered from where reports of silicosis deaths were received.

The methodology involved was collection of Primary Data through survey form (refer questionnaire in **Annexure VI**), collecting all previous medical records and discussion with families and village folks about their perception of the problems and factors forcing them to migrate and work in these factories. Also visits were made to factories at Balasinor and Godra where persons from these villages had worked.

In the survey form one group of questions were regarding the details of occupational history (exposure history) was taken

[10] We even met workers as far as Jaisalmare during our visit to Balasinor factories, but to estimate the extent of spread was beyond our scope and means.

which included the name of factory, nature of work done, hours of exposure, duration of work done at the factory, employment record, insurance record etc.

The survey team comprised of a social worker, a doctor and volunteer of Khedut Mazdoor Chetna Sangathan, Alirajpur.

The other set of questions were regarding the illness, the type of symptoms which appeared, duration of symptoms and expenses on illness, distress sale of assets for getting medical treatment etc.

On the basis of these two sets of questions a provisional diagnosis of Silicosis has been made. Essentially the persons who worked in these factories got exposed to silica dust of varying intensity and duration and symptoms attributable primarily to the respiratory system occurred after the said exposure.

Out of these in 47 cases the diagnosis was further confirmed on the basis of detailed occupational History, Illness History, Physical Examination and chest X-rays done at Govt. Civil Hospital, Alirajpur by Dr P. Dhoke, MD Medicine in camps organized between 1/8/05 to 28/8/05 and again on 5/6/05. In his 1st report submitted on 13/9/05 Dr P.Dhoke diagnosed 14 cases as silicosis and 16 cases as silico-TB (Total 30). In the 2nd camp on 5/6/06 27 cases were diagnosed as silicosis or silico-TB. (Placed in **Annexure I**)

Out of the 27 cases diagnosed as silicosis in Civil Hospital, Alirajpur, 7 cases were further confirmed by designated Independent Readers using ILO International Classification of Radiographs of Pneumoconiosis, Revised Ed, 1980(**Annexure IV**), based at Occupational Disease Detection Centre, ESI Hospital, Belur, West Bengal.(**Annexure II**)

The secondary data was collected from NIOH, GPCB, MPPCB, CPCB, PRASAR and Civil Hospital Alirajpur.

6. Analysis

A survey was conducted in 21 villages of Alirajpur Tehsil of Jhabua District. In all 218 households where 489 persons had a definite exposure to silica dust of varying intensity and duration in these 21 villages were surveyed. All those houses of the village were covered from where people had worked in factories.

Table 1 Total number of Exposed Persons.

		Number	Percentage
1	Sick	266	54
2	Dead	158	32
3	Exposed	65	14
	Total	489	100.0

Source: Primary Survey, Year: 2006, n = 489

** (List of Dead Persons placed in **Annexure VI**)

Of the 489 persons who were exposed to silica dust for varying periods, 86 % (424) are either ill or dead (reference period was 5 years). Silicosis is a fatal, non treatable disease and those who are having symptoms because of illness would also eventually die very soon like others.

Even though the cases who have reported as sick and dead may not all be carrying a medical diagnose of silicosis as per the stringent guidelines prescribed by ILO international classification, yet they can be referred to as the victims of silicosis with considerable certainty on the basis of the methodology described above. ***Out of the total 489 persons surveyed 266 are still surviving and sooner or later they will die because of the disease and if any steps are to be taken for their diagnosis by***

designated authority, have to be done urgently so that they be compensated and their statements recorded because many of their employment records are not there in the Factories

On the basis of these data figures, it is clear that silicosis has taken a considerable toll of the population of this region in terms of spread and fatality.

Sh B.K. Singh, member Secretary, MP Pollution Control Board in a presentation before the committee designated by Govt. has also recorded that, "about 36 cases of Silica have been reported in three villages of Jhabua and these villagers had been exposed to silica during their employment in Quartz industries of Godhra".[11]

Ringnia s/o Jamsingh

Ringnia is in is last days and is finding it difficult to breathe. He has accepted that he is now going to die. ***His last wishes are that nobody should go to work in the killer factory.*** He is only 21 years and unmarried. In his last days his breathing has become extremely laboured and can be heard from a long distance. He was supporting his parents by working in the factory but after their death he is dependent on his sister. He worked in the factory for 3 years and when he became ill he was turned out. He came back and sold his land for treatment. But silicosis would not spare him either. **Ringnia walked himself to the health camp held in civil Hospital Alirajpur on 5th June 2006 but on 19/7/06 he died.**

[11] Report of the committee on Spreading of Silicosis and Pneumoconiosis Disease Due to Pollution from Quartz Industries Loocated in Godhra, Gujarat.

Table 2 Age Wise Break-up of affected/exposed persons.

	AGE		Sick	Dead	Exposed	Total	Percentage
	0-14		3	09	0	12	02
		15-18	*32*	*24*	*2*	*58*	*12*
		19-25	*81*	*38*	*15*	*134*	*27*
	15-25		113	62	17	192	**39**
	26-50		136	80	44	260	**53**
	>50		14	06	4	24	05
	NA			01			
			266	158	65	489	100

Source: Primary Survey, Year: 2006, n = 489

Table 3: Age & Sex Wise Break-up of affected/ exposed persons.

	AGE		Sick		Dead		Exposed	
			M	F	M	F	M	F
1	0-14		01	02	02	07	0	0
2		*15-18*	*15*	*17*	*15*	*09*	*01*	*01*
		19-25	*30*	*51*	*24*	*14*	*07*	*08*
	15-25		45	68	39	23	08	09
3	26-50		82	54	56	24	23	21
4	>50		09	05	04	02	03	01
	NA					01		
			137	129	101	56	34	31
			266		158		65	

Source: Primary Survey, Year: 2006, n = 489

Affected persons were the prime breads winners of family. Majority of persons affected **92%** are in age group of 15-50 years. ***There are 70 children below the age of 18*** who were affected out of whom 31 have died due to silicosis.

Jhendi, Indersinghchowki

In 2006, Jhendi has finally got relief from her troubles. But when she lived it was very torturing for her to see herself dying, leaving nobody to look after her 4 children, Sirja 10F, Sukli 8F, Chindi 5F and Bhangra 3M years old. In 2003 Jhendi went to Balasinore to work in Quartz crushing unit to feed herself and her children. She earned Rs 300 per week but when she returned home she already was suffering from cough and difficulty in breathing. She gradually started loosing weight and became very thin. Her husband was in Jail for some criminal offence. She moved to her brother's house in Indersingh Chowki and in a medical camp organized by the Civil Hospital Alirajpur her illness was diagnosed as silicosis. Now even her brother has refused to look after the 4-orphaned children. **Jhandi was photographed by us with her children in Dec 2005 and shown in our earlier report.** ***Copy of report of Civil Hospital Alirajpur showing Jhendi as Silicosis victim placed in Annexure I***

Table 4- Tribe Profile of affected/exposed persons.

		Sick	Dead	NR	Total
1	Bhils	158	94	0	252
2	Bhilala	86	63	08	157
3	Kotwal	22	01	57	80
	Total	266	158	65	489

Source: Primary Survey, Year: 2006, n = 489

All the persons who were exposed/affected or have died were Tribal population mainly belonging to Bhil, Bhilala and Kotwal tribes (all from 100% tribal villages).

Idla's Family

Idla lives in a small village Rorda close to Alirajpur in joint family with his brothers. **11 members of his family are already dead** because of silicosis and 3 members are in terminal stage of illness. The family has a very small land holding which is having rocky soil and yields them crop only in the rainy season. It was hardly enough to provide for their join family. All those who died had gone to Godra to work in the quartz crushing units to provide a basic living for their family. They have taken huge loans to provide treatment for their ill members and even sold some land.

Table 5- Village Wise breakup

Sn	Name of Village	Tehsil	Total Population 2001 census	No of exposed/ affected		No of Deaths	
				Families	Persons	Deaths	Cumulative Deaths
1	Dhayana	Alirajpur	1074	45	74	38	38
2	Rordha	Alirajpur	1077	19	38	25	63
3	Bholwat	Alirajpur	567	34	56	23	86
4	Malwai	Alirajpur	706	23	63	21	107
5	Ghognsa	Alirajpur	1966	06	21	18	125
6	Indersingh chowki	Alirajpur	2665	05	11	08	133

Sn	Name of Village	Tehsil	Total Population 2001 census	No of exposed/ affected		No of Deaths	
				Families	Persons	Deaths	Cumulative Deaths
7	Rampura	Jobat	699	07	30	08	141
8	Ambari	Alirajpur	1299	16	49	06	147
9	Kadvaliya	Alirajpur	939	24	57	0	147
10	Dipakichowki	Alirajpur	847	02	03	02	149
11	Morasa	Alirajpur	1937	09	18	02	151
12	Khamedaka	Alirajpur	973	01	02	02	153
13	Thanasembli	Alirajpur	700	01	02	02	155
14	Chanpur	Alirajpur	2498	05	18	01	156
15	Bhedva	Alirajpur	1229	02	02	01	157
16	Gadat	Alirajpur	996	01	01	01	158
17	Titi	Alirajpur	2130	10	18	0	158
18	Richvi	Alirajpur	1481	03	11	0	158
19	Kharkuan	Alirajpur	1802	01	01	0	158
20	Kherwad	Alirajpur	567	01	05	0	158
21	Kasba	Jobat	1514	01	09	0	158
	Total		19611	218	489	158	158

Source: Primary Survey, Year: 2006, n = 489

Ringnia in his last wishes before his death had expressed that nobody should go to work in the killer factory.

Of the 21 villages covered 19 were located in Alirajpur Tehsil and 2 in Jobat tehsil of Jhabua District. As is seen from the above data **5 villages** of Alirajpur have suffered maximum deaths i.e. Dhayana(38), Rordha(25), Bolwat(23), Malwai(21) and Ghongsa(18) making a cumulative total of **125 deaths**. Bolwat and

Malwai are very small villages having population less than 1000 and also very close to Alirajpur town.

Apart from those who have died these villages have maximum exposed and affected persons. In above mentioned 5 villages and Village Ambari, Rampura and Kadvaliya total affected/exposed persons were **388 (in 8 villages)**.

*In **Bholwat- Dhayana** villages bears a deserted look. These small villages have seen as if an epidemic of silicosis. The total population of Bholwat is only 567 (Male 253 and F 311 as per 2001 census) and of Dhayana population is 1074 (number of persons affected in these villages have been 130 -Bholwat-56, Dhayana-45) and 61 have died in the last 3 years. The total affected-exposed families in these two villages are 130. Ujari phaliya of in village Bholwat has borne the brunt of the tragedy where almost all male members have died. Apart from the tragedy of loosing their kins the families are finding it hard to eke out a living and are literally in a starving situation with nothing to eat for days together.*

*Kanjali widow of Bahadur is finding it difficult to struggle to keep her family alive with meager resources. **7 members of her family died.** Because of no work in the village they all went to work in the silica mines of Godra. From 1996 to 2000 they all worked for 3-4 years in Kumbani minerals, Kumar Minerals and Akil Minerals. There they worked in the crushing areas and their work was to lift stones and put them in crushers and fill bags with powdered silica. They were totally unaware of the impeding illness that the mineral causes. They developed symptoms like cough, chest pain and difficulty in breathing which gradually progressed. Their body started wasting and gradually all of them died a painful death. Two sisters of Bahadur, Gendali aged 12 years and Mendali aged 10 years died in 2000 and 2003 respectively.*

Table 6 Factory Wise breakup.

Sno	Name of Factory	Dead	Sick	Total
1	Gayatri, Balasinor* (Now renamed as Quality Quartz)	44	63	107
2	Jyoti, Balasinor*(Now renamed as Hari Om Minerals)	37	49	86
3	Kumar Industries Corp, GIDC Godhra.	32	21	53
4	Kumar Minerals Pvt Ltd[12], Godra	15	26	41
5	Uma Minerals, Balasinor*	9	37	46
6	Akil Mines, Godhra (name ~~now changed~~ could not trace changed name)	8	16	24
7	Jay Jalaram, Kalol	1	20	21
8	National Minerals Godhra.	3	8	11
9	Diamond Abrasive, Godhra	6	4	10
10	Bharat Silica, Godhra	1	6	7
11	Yamunaji, Godhra		6	6
13	Lucky Mines, Godhra (couldnot be traced)		5	5
14	Shivshakti Mines(couldnot be traced)	1	1	2
15	Sangita(couldnot be traced)		2	2
16	Ganpat, Umrali (could not be traced)		1	1
17	Godhra (factory name unknown)	1	1	
	Total	**158**	**266**	**424**

Source: Primary Survey, Year: 2006, n = 489

** Not covered by ESI Act. None of the Factories at Balasinore covered by ESI Act.*

[12] There are two factories in GIDC Godra in the same premises owned by common owners in the name of "Kumar" M/s Kumar Minerals Pvt Ltd (now closed) and Kumar Industries Corporation but workers are not able to discern the difference .

** List of Factories as available with Office of Factory Inspector, Godra (Annexure VII)

Three factories viz **Gayatri (now named quality quartz), Jyoti (now named Hari-Om), Kumar** have been responsible for maximum number of deaths and ill totaling to **159 out of 266 who are ill and 128 out of 158 deaths** that occurred in these villages. It is in these very factories that majority of the sick people worked totaling to 159.That means these factories have been responsible for destroying the lives of 287 workers in the 21 villages surveyed-there may be many more in other villages. But no punitive actions have been taken against them neither were their owners booked in any criminal offences for knowingly causing so many deaths because of non-compliance of Factory Laws.

Most of the workers who were questioned during the survey reported that the working environment of the factories in Godra and Balasindhur is highly polluted. These factories are grinding quartz rock which is causing so much dust in the factory area that one cannot see beyond 1 feet. People have contracted silicosis within 2-3 months of working in the factory. The labour inspectors do not report about the adverse affect of disease.

Very high dust level in the factory environment was personally investigated by the investigation team and has also been reported by various Govt. Agencies from time to time.

Sh J.S.Kamyotra, Additional Director, CPCB, Delhi in a presentation in 2006 before the committee designated by Govt. has also recorded that,

"Huge fugitive emission due to the leakages, vibration of the machinery, crushing, pulverizing, screening as well as emission from the vents was observed in the work place during the visit. Working under such condition for a long time, the possibility of silicosis is very much eminent.

The house keeping was observed to be very very poor in all the cases and the work place is filled with 6-10" of silica dust on the floor, when the workers walks on it the dust is also getting spread.

No monitoring for fugitive emission (including particle size distribution) at workplace has been carried out so far."[13]

As per the information furnished by Gujarat Pollution Control Board, regional office[14] at Godra in response to application of KMCS samples Ambient Air Quality Analysis (Collected outside the factory premises on 15/6/05) shows SPM[15] of 8837 µg/nm and RPM of 968 µg/nm in Kumar Industries Corporation, 63,GIDC Estate, Godra (Permissible Limit/TLV is 0.5 mg/m^3)

Thus it is not accidental that so many workers have suffered from dust related disease by working in the Factories. The dust levels in the factories have been much beyond the permissible limits (TLV) subjecting the poor workers to very high exposure leading to fatal illnesses. While these workers are dying quietly in their homes and villages, the factories are earning huge profits with impunity***("7000 crores rupees capital investment in Gujarat for Industries related to our product"*** - as per the presentation of Sh Habib Bhai, President of Panchmahal Minerals Manufacture Association, Godhra. before the committee on silicosis- with respect to the profit potential of silica products) in silent approval of the Labour Departments which have failed in

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[13] *"A Brief Presentation On The Spreading Of Silicosis And Environmental Management In Quartz Industry Located In Godhra And Balasinor, Gujarat", CPCB, West Zone Office, Vadodara*

[14] Gujarat Pollution Control Board, Regional Office, 20 Haidri Society, Opp. DSP Bunglow, Civil Lines Road, Godhra.

[15] SPM: Suspended Particulate Matter RPM: Respirable Suspended Particulate Matter TLV:Threshold Limit Value for silica dust is 0.5 mg/m^3.

their duties to take actions against these factories or take criminal actions against the factory owners. The factories have resisted all attempts even to admit that any illness was caused by the factory environment ***("Till today there is no silicosis case diagnoses by E.S.I.C.")***[16] and ward off all claims of compensation. In fact they are not maintaining proper record of employment to show that these persons actually worked in these factories.

Table 7- Duration of Work:

		Less than 6 months	6-12 months	More than 1 year	More than 2 years	More than 3 years	More than 4 years	More than 5 years	Total
1	Sick	148	02	59	34	23	0	0	266
2	Dead	30	21	23	43	32	08	01	158
3	Exposed	65	0	0	0	0	0	0	65
	Total	**243**	**23**	**82**	**77**	**55**	**08**	**01**	**489**

Source: Primary Survey, Year: 2006, n = 489

From the above data it is seen that 148 persons suffered the illness and 30 died because of Silicosis with exposure less than 6 months. In fact most of the deaths i.e. 94% (149 deaths) have occurred with exposure of less than 3 years-all acute silicosis.

It clearly is a reflection on several points with respect to the factory

i) The level of exposure to silica dust is very high-this is mainly due to two factors

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[16] As above.

- the dust pollution is excessive and more so of the size (dust particles of size less than 5μ) which causes Silicosis.
- The working hours of the labourers are very long. The workers have told us that they worked in two shifts of 12 hours each Ist from 7 AM to 7 PM and 2nd shift from 7 PM to 7 AM they earn only Rs 40-50 per day. The workers also slept in the factory premises while the factories were running thus inhaling the same dust while asleep. Some worked even two shifts to earn more -means double exposure. Many of the workers go in groups taking their children, who also stay and sleep in the same environment.

i) The dust contains very high percentage of Free Crystalline Silica (More than 90%[17]).

ii) The poor nutritional status and health of the Tribal labourers make them more prone to the fatal affects of the disease.

It would be relevant to refer to the factors which cause ncreased vulnerability to Silicosis and the types of silicosis.

There are three types of Silicosis depending upon the airborne oncentration of crystalline silica to which worker has been xposed.

Acute Silicosis: Occurs where exposure are three the highest and an cause symptoms to develop within a few weeks or upto 5 years.

)Accelerated silicosis results from higher exposure and develops ver 5-10 years.

) Chronic Silicosis usually occurs after 10 or more years.[18]

Presentation of Sh Habib Bhai, of Panchmahal Minerals' nufacture Association, Godra as above.

US department of Labour, Oct,31,1996, NIOSH-Fact Sheet.

Factors affecting onset of silicosis[19]

- The amount of dust inhaled
- The percentage of free or uncombined silica in the dust
- The size of the dust particles, and
- The length of exposure

Table 8 Expenditure on Treatment:

S.No	Expenses Range (In Rs 000)	No of Persons	Percentage
1	0-05	34	9.7%
2	05-10	118	33.8%
3	10-20	77	22.1%
4	20-30	47	13.5%
5	30-49	9	02.6%
6	>=50	64	18.4%
	Total	349	100%
7	Not responded	140	
	Total	**489**	

Source: Primary Survey, Year: 2006, n = 489

[19] Silicosis and its control in Silica Flour Milling CPCB Meeting Godhra 19th April Dr H N Saiyed
National Institute of Occupational Health (Indian Council of Medical Research) Ahmedabad.

Table 9-Distress sale of Assets:

1	Silver Sold	60
2	Land Sold	68
3	Land mortgaged	05
4	Cattle sold	12
5	Trees Sold	10
6	Taken Loan	20
	Total	**175**

Source: Primary Survey, Year: 2006, Multiple response Table

Working in the factories of Godra has not yielded much income to the workers. A report in Dainik Awantika estimated that a maximum a worker must have earned from the employment is around Rs 50000/- in 2 - 3 years. On an average the earnings have been in Rs 8000-9000 in two and half years but majority had to face death for these earnings.

Those who died or are struggling to keep alive because of their illness have left huge debt burdens on the families due to expenses on their treatment. 118 persons (33.8%) of persons have reported spending from Rs 5000-10000 for their illness. It is not a small amount for persons who were earning Rs40-50 and now have no earnings. Sixty-four persons had to spend more than 50000/- on their illness.

Since the persons had meager resources they had to borrow at heavy rate of interest from market or sell of their assets like land. Majority of the persons (68) had to sell of their land and many had to sell their Cattle (12) which are productive assets and selling them indicates extreme economic distress.

7. Migration and Status of Employment in Jhabua.

Jhabua is Tribal District of MP bordering Gujrat and Maharashtra. The main tribes residing there are Bhils and Bhilala Adivasis. It is totally rainfed area and has 100% rainfed, agricultural economy. The people carry-out subsistence agriculture mostly growing food crops like Small Millets- Jawar, Bajra, Maize etc. The terrain of the district is hilly and soil fertility is very poor. The yield is very less and most farmers have to be satisfied only with one crop per year. It is one of the most economically backward areas. After the Kharif crop is harvested most of the people have to migrate to sustain their families as there is no employment in the villages and small land holdings are not able to sustain the tribal families. With the large scale influx of outsiders in the areas many tribals have lost their land to non-tribals and there have been many other forms of exploitations like Land alienation and displacement from the forests by the forest dept.

8. Prevention steps at factory level

The Quartz crushing units are subject to very stringent regulations because of generation of silica dust. The type of protective methods have been clearly written in the reports of NIOH and CPCB and as per the Factory Act and Labour Laws. proper records and regular medical examination of the workers has to be done. But despite clearance given by factory Officials and Pollution control Boards the situations at the ground remains extremely pathetic. There is no proper record maintained by factories regarding the number and attendance of workers and no medical check up is carried out by many of these units. The irony is that the owners are very much aware of the toxic nature of the silicon dust and therefore sit in offices which are sealed with glass windows far away from the dusty areas. Incase they have to visit the factory areas instructions are issued to stop the units atleast 2-3 hours before.

9. Media Findings:

The issue of Silicosis in Jhabua was widely covered in the media some illustrative news items are summarized below.

On 20-06-05 a half page article appeared in Danik Awantika (Hindi) by Sudhir Sharma. According to this report, 85 persons of Thandli-Meghnagar (Jhabua Dist) died in the last 15 months because of "unknown illness caused by working in white powder factories of Gujarat namely Dharti Dhan Minerals and Hindustan Minerals of Godhara due to very high levels of dust which is inhaled by workers while working there. The report analysed that money @ of Rs 2 is paid to the labourers for crushing upto 60-70 Kgs of stone .It further analysed that during the entire duration of work the total money earned by the labourers was merely Rs 5000-9000 in exchange for their lives.

On 23-3-06 Navbharat (Hindi) published a news in which the Collector of Jhabua District gave assurances that all the ill persons will be treated at the Govt hospitals and provided free medicines. He also directed the Labour Department to conduct detailed survey to identity the silicosis patients. He claimed that there was enough work available in the villages and appealed that people shouldn't go to the factories to work.

On 21-08-05 Samaygati Reported about the non action of local administration despite assurances given by the SDM, Alirajpur. Three organizations of Alirajpur KMCS, Yuva Adivasi Sena and Adivasi Ekta Parishad demanded that all killer factories of Gujarat should be shut down and means livelihood should be provided for family members of those who have died

On 24-12-05 Dainik Sandhya Prakash (Hindi) Published photographs of four emaciated persons who were reported to be suffering from the debilitating disease of Silicosis. It reported

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about the meeting of Sh Shankar Tadawale of KMCS with the Chief Minister of Madhya Pradesh, Sh Shiv Raj Chauhan during which a memorandum was submitted to him. In the memorandum it was demanded that the factories of two cities of Gujrat viz Godhara and Balasinore should be closed, the actual number of persons in Jhabua who have suffered the disease should be thoroughly surveyed and provide employment in the village itself to prevent out migration.

On 2-4-06 Desh bandhu(Hindi) carried a detailed report by Sh Rajinder Bandhu. The news focused on the tragic situation the illness and death has caused in Rordha village where 22 persons have died because of silicosis in the last 3 years.A 45 year Kali and his wife Durgi worked for 8 months in Gujrat factory and died due to the disease leaving behind four daughters aged between 4-15 years and nobody to look after them. The same village has lost 14 year old Gopal and 16 year old Bhangdi. The report has given village wise number of deaths and illness due to silicosis. The news quoted Sh Shanker Tadawale of KMCS as saying that their Sanghatan has made representation to all wings of administration from collector to the CM but nothing has been done to stop these deaths.

25-5-06 Outlook carried an article " The breath of Death" which reported 400 deaths of Tribals and 1500 ill due to Silicosis . It adds that those who are ill would also die because there is no cure for the disease.

On 10-9-06 Navbharat carries a statement of the Union Minister Sh Kanti Lal Bhuria according to whom the daily deaths of tribals occurring in Jhabua would be brought to the notice of the PM.

On 6-10-06 Dainik Bhaskar wrote that 2000 deaths have been reported from Alirajpur, Thandal, Meghnagarof Jhabua and Dhar districts.

10. Doctors' reports

i) Preliminary Report of Govt.Medical ‖ 22/10/03 officer, Civil Hospital, Alirajpur. ‖

The Govt. Medical Officer of the Civil Hospital, Alirajpur, Dr P.Dhoke, MD, Medicine visited village Malwai , Tehsil Alirajpur, District Jhabua, and conducted investigation there on the behest of the Local Administration. In his report submitted to the Civil Surgeon, District Hospital, Jhabua on 22/10/03 he has given names of 5 persons who died and 33 persons who are ill in the village Malwai. The persons reported to be ill were suffering from symptoms of fever, cough, loss of weight, loss of appetite and weakness. The were reported to have worked in stone crushing factories of Gujrat one year ago. After 3-4 months from returning to their village Malwai they developed these symptoms. The M.O. has made a preliminary diagnosis of TB in many of these cases. He has further added that since these people has a history of working in stone crushing units prior to their illnesses, possibility of them suffering from a disease called Silicosis post return could not be ruled out. He stated however the diagnosis would be confirmed by detailed examination

ii) Post-Mortem Report of Civil Surgeon‖ 18/08/05
Civil Hospital, Alirajpur.

Post Mortem Of Sh Mehtab s/o Versa dated 18/8/05 done by Dr K.C. Gupta. Mehtab had worked in Quartz Crushing factory M/s Jyoti Minerals, Balasinor, Khera district Gujrat for 8 months in 2003.He died on 18-8-05 after falling ill with symptoms of respiratory tract along with two more labourers. The KMCS took out a huge rally in Alirajpur and raised a number of demand for the victims. The PM examination of Mehtab was done on 18/8/05 and the report says that:

"The body was cold and emaciated. Chronic illness. Skin shriveled. Abdomen shrunken ... Both Pleural layers sooty thickened with adhesion to Chest wall. Lungs are solid in consistency. Gritty feeling on cutting. Mosaic appearance lung surface. Lungs in fibrosed condition. Death occurred due to Chronic Debilitating Disease (nature of Lung disease will be given at Histo-pathological. examination.) Lungs preserved in formalin solution for Histo-path Examination."

iii) Detailed Examination Report of Govt ‖13/09/05
Medical Officer Civil Hospital ‖
Alirajpur.

A medical camp was organized by the Civil hospital, Alirajpur on behest of KMCS and the people were mobilized by the sangathan. Detailed Physical examination and Chest X-rays of 37 persons were done between 1/8/05 to 20/8/05. In a letter to the Tehsildar, Alirajpur Tehsil, District Jhabua, the Medical officer,Civil hospital,Alirajpur, Dr P.Dhoke, MD, Medicine, submitted a detailed report on 13/9/05.

In his report the MO gave village wise details of names and diagnosis of the persons examined on the basis of Physical examination and Chest X-rays as per following details.

a) Silicosis	13
b) Silico-Tuberculosis	16
Total	**29**
c) No changes in X-ray chest	08

iv)Detailed examination at camp at Civil Hospital, Alirajpur

On the basis of Chest X-rays sent to Belur ESI (TB)hospital P.O. Sapuipara (Bally), Howrah, WB. In all 16 plates were examined by three independent reader using ILO International Classification of Radiographs of Pneumoconioses,Revised Ed,1980. The report was finalized on the basis of the mean rating of the readers. As per their report,

"... Out of 16 Chest X-rays rated, 5 are of poor quality, and out of rest 11 X-rays,7 are found to have ILO rating commensurate with the diagnosis of SILICOSIS, provided the subjects have definite exposure to active silica dust"

11. Reports of NIOH and Pollution Control Boards

i)Project Report- Evaluation of Health Hazards In Quartz Crushing Industry And Evaluation of Dust Control Measures. April,1982-March,1984.

As per the background information of the report, *"in 1980, Gujarat Industrial Development Corporation, Ahmedabad, drew attention of the NIOH to the air pollution problem caused by the quartz crushing industry at Godra (Gujarat).Subsequent visits by*

the director and Senior scientists of the institute revealed that the environment inside the quartz crushing factories posed a more severe threat to health of the workers than the air pollution problem, it was decided to carry out environmental and medical studies in these factories."

The Objective of the study was to find out the prevalence of dust related morbidity in Quartz workers and to correlate the morbidity with the environmental conditions and suggest measures for prevention.

The study found that there were 20-30 units of quartz Crushing in Gujarat state engaged in manufacture of Quartz Powder. Each factory employed about 6-40 workers and labour turnover was very high.

In the medical part of the study Chest X-rays of 75 quartz workers inside the factory was done and 52 control workers were studied. It was found that 9 of the workers showed changes of Silicosis as per the international classification of Pneumoconiosis. Important point was that 44 out of 75 workers were employed for less than one year. The report concluded that there was very short duration of exposure to the worker population studies and there was high labour turnover in these factories. The researchers have traced the workers who had left the factories and found out that **about 90 workers had died after leaving the job. Those who had died were between the age group of 30-35 years.**

The researchers also studied the dust levels in 6 factories of Godra. They collected samples for "total dust" and "respirable dust" ***It was found that the mean value of dust concentration was between 81 to 660 times higher than the threshold level limit values(TLV) suggested by ACGIS[20](1977).***

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[20] Amercian Conference of Govt. Industrial Hygienists considered as standard internationally.

ome very important recommendations were made by the esearchers which included:-

1. ***Surveillance of the environmental dust level is highly essential.***

2. ***The pre-employment and periodical medical examination of all the workers by competent authorities should be made mandatory.***

ii) **Report of Director on Zhalod and Dahod Cases** **December 2004 NIOH, Ahmedabad.**

A quick health survey was conducted by NIOH at Community lealth Centre, Zhalod, Gujrat from 26-27th October 2004.

ZHALOD CASES

Out of the 24 cases examined in Zhalod 9 cases were iagnosed as having Silicosis or Silico-TB as per ILO classification hile for 3 repeat X-ray was advised but never done. Those iagnosed as silicosis had worked in factories of Godra viz adri,Hindustan,Bharat. Their period of exposure was 4 months nly to 2 years.

DAHOD CASES

The Director of NIOH also forwarded a report titled as *Details of the clinical and radiological findings of the seven uspected cases of silicosis from Dahod".* All the affected persons ere male with ages varying from 17 years to 35 years. Duration of xposure to silica dust was fro 2 to 8 months only. The xamination included Lung unction tests and Chest X-rays. Out the

8 cases examined 1 cases was diagnosed as silicosis and 6 as silico-TB. **(Annexure III)**

iv) **Report of the Committee on Spreading of Silicosis and Pneumoconiosis Disease Due to Pollution from Quartz Industries Located in Godra, Gujrat.**
Sept, 2006

On the basis of news reports appearing in the news papers CPCB set up a committee of 11 members with Dr H.N. Saiyed, Director NIOH as the Chairperson and Sh J.S. Kamyotra as the convener. The committee visited 4 factories at Godhra on 19-4-06 and infracted with the Quartz Industry representatives also. on the day of their visit the quartz units were not operating because of load shedding.

The important observations of the committee during the visit included that, the process of quartz crushing is inherently dusty and the silica content in quartz is up to 99%. The committee also made observations regarding the conditions in the factories which causes exposure of workers to silica dust and lack of monitoring mechanism of silica in the factories.

Habib Bhai, President of the Pancmahal Minerals Manufacturers Association, Godra made presentation before the committee and stated that quartz having silica up to 99.65 % was used fro glass, refractory products and paints. He stated that workers wore masks regularly and not a single case of silicosis has been diagnosed by ESIC.

The chairperson reported that as per the factories Act 1948 permissible levels of free silica is 0.1mg/m3 in working zone (8 hour exposure)

Dr. Saiyed opined that in one of the studies conducted by NIOH 18 male and 21 female workers were found to be having silicosis on the basis of Chest X-rays due to working in silica flour mills.

Dr D. Brahmaiah of CPCB observed that out of 24 quartz crushing units in Godra 17 were in operation and in Balasinore 6 units were working. He highlighted about the lack of air pollution control system in the crushing sections of the factories.

Sh M.M. Shah Joint Director Industrial Safety and Health, Vadodara 82 prosecution cases were launched against 12 industries in 2005 and two have been convicted imposing fines of Rs 5000/- and imprisonment for 2 years.

He added that in Godra there were 150 workers engaged in quardz crushing industries.

The committee made important recommendations like Medical examination of all workers, installation of pollution control devices, maintainance of proper record of employment etc.

However, it has been seen that such recommendations were also made earlier by NIOH in 1980s but never heeded too. The factory owners also have stated that there were no cases of silicosis quite contrary to the presentations made by various members of the committee.

12. Conclusion

1. As per survey 21 villages of Alirajpur Tehsil of Jhabua District in 218 households, 489 persons had a definite exposure to silica dust of varying intensity and duration and out Of the 489 persons who were exposed to silica dust for varying periods,158 are dead and 266 ill i.e. 86 % (424) are either ill or dead.
2. Out of the total 489 persons surveyed 266 are still surviving and sooner or later they will die because of the disease and if any formality if to be done for their diagnosis by designated authority has to be done urgently so that they be compensated.
3. Persons affected are in prime breads winners of family. Majority (92%)of persons affected are in age group of 15-50 years.
4. There are 70 children below the age of 18 who were affected out of whom 31 have died due to silicosis.
5. 5 villages of Alirajpur have suffered maximum deaths i.e. Dhayana(38), Rordha(25), Bolwat(23), Malwai(21) and Ghongsa(18) making a cumulative total of 125 deaths. Bolwat and Malwai are very small villages having population less than 1000.
6. Three factories viz Gayatri, Jyoti, Kumar have been responsible for maximum number of illness and deaths totaling to 159 out of 266 ill and 128 out of 158 deaths.
7. Most of the deaths i.e. 94%(149 deaths) have occurred with exposure of less than 3 years-all acute silicosis.
8. 118 persons (33.8%) of persons have reported spending from Rs 5000-10000 for their illness. 64 persons had to spend more than 50000/- on their illness.
9. what are the legal provisions violated by Factories (like necessary safety measures, labour right violations, environment pollution etc..) And what steps taken by the Govt.

RECOMMENDATIONS:

1. Detailed survey of the Villages should be done by organization like National Institute Of Occupational Health, Ahmedabad for recording cases of Silicosis.
2. Immediate and adequate compensation should be given to families of the dead and the persons are suffering from ill.
3. Strict action should be taken against culprit factories specially the three factories of Balasinore and Godra (Gayatri Minerals now named as Quality Quartz and Jyoti now named Hari-om Minerals of Balasinore and Kumar Minerals of Godra) which have caused maximum deaths and also the concerned Govt. officials who let these things happen right under their nose. Steps should be taken to immediately reduce the dust levels in all the factories and until then they should be asked to close down.
4. Proper Employees State Insurance records and records as per the Factory Act 1948 and ESI Act 1948 should be maintained by factories with checking by Govt. doctors. Privately designated doctor should not be allowed to check.
5. Awareness should be spread among workers working in the factories regarding causes and fatal affects of Silicosis.
6. Factory management / Govt department should spread awareness on causes and fatal affects of Silicosis among the workers and affected villages
7. Out migration of tribals from their villages should be prevented by providing them employments in their villages and proper implementation of the Employment Guarantee Act.

ANNEXURE-IV: PANCHNAMA OF MALWAI VILLAGE

*We, the Panches of Village Malwai,*hereby, dictate this Panchnama today on 14/10/03 have gathered here on being called by the concerned families. We dictate in this Panchnama that people of our village went to Balasinor,Gujrat for wage labour in (1)Jyoti (2) Aman (3) Gayatri (4) Narayan named factories where stone is crushed and where our village people went to work. These persons are at present dying because of illness and falling ill. The names of died and ill persons are following:-

1. Devla s/o Datliya 22 years died 2 years ago.
2. Raman s/o Davliya 20 years died 2 years ago.
3. Datliya s/o Rai Singh 52 years died 1 years ago.
4. Gunjala s/o Chotu 22 years died on 11/10/03.
5. Kanki s/o Nanla 40 years died on 13/10/03.
6. Dhamariyas s/o Lurla 55 years Ill
7. Gujriya s/o Nanliya 35 years Ill.
8. Minti w/o Gujriya 30 years Ill.
9. Ram Singh s/o Devliya 25 years Ill.
10. Dhamri d/o Sumariya 19 years Ill.
11. Sahabai s/o Runsingh 25 years Ill.
12. Kamli w/o Detliya 36 years Ill.
13. Chotu s/o Monu 45 years Ill.
14. Bhangri w/o Chotu 45 years Ill.
15. Sikriya s/o Chotu 18 years Ill.

The Panchnama has been read over to us and whatever is written is correct therefore we have placed our thump impression/Signatures.

1. Mukesh s/o Shiv Lal SD/-
2. Dumriya s/o prem Singh SD/-
3. Kunwar Singh s/o Versingh SD/-
4. Kaushik Kumar Vaghela LTI/-

Dated 14/10/03

ANNEXURE-V Survey Questionnaire (English translation)

SURVEY FORM:

Date.....

1. Name and Father's/Husband's Name .....
   Complete Address.....
2. Details of Family Members:

Sn	Name	Caste	Age	Sex	Occu-pation	Land Area	Livestock/ Poultry
1	2	3	4	5	6	7	8

3. Details of Persons who worked in Quatrz Crushing Factories.

Sn	Name	Age	Name of Factory	Dur-ation	Period	Daily Wage	Affect
1	2	3	4	5	6	7	8

symptoms	Treatment	Illness/Death Since when/when
9	10	11

4. If Death of bread winner source of present livelihood.....
5. Any Documents (Medical Report/Post Mortem Report/Photo/Affidavit/Factory Card)
6. Type of work done in factory.....
7. Expenses on treatment/source.....
8. No of daily Hours of work/ no of Shifts.....
9. Reason for stopping work.....
10. Details of Protective Gear in Factory.....
11. Any I-Card Prepared.....
12. Any Insurance Done.....

Name of Head of family_____

ANNEXURE-VI Note on diagnosis of silicosis and ILO Classification.

Diagnosis of Silicosis is made on the basis of:

i) Occupational History : History of exposure to crystalline silica dust for which details of exposure have to be found out i.e. Nature of factory, Nature of work done in the factory, Duration of exposure(Number of hours spent inside the work environment each day, Number of months worked in the factory),Level of dust in work environment.

ii) History of Present Illness : Details of symptoms, mode of their onset, duration, severity specifically related to respiratory system like cough, sputum, breathlessness (difficulty in breathing), Chest Pain and general ones like Loss of weight, loss of appetite, general physical weakness etc.

iv) General Physical Examination and Detail Examination of Chest.

v) Chest X-Ray As per the International Labour Organisation (ILO) guidelines Chest X-ray is a considered sufficient to establish the Diagnosis of Silicosis.

The "**ILO International Classification of Radiograph of Pneumoconiosis Revised Ed 1980**" describes the criteria for establishing Diagnosis of Silicosis. The Diagnostic Criteria laid in the classification are simplified and described as under.

Silicosis is caused by accumulation of Dust Particles in the lungs. The size of the dust is as small as 0.5 to 5 micron. Due to the dust there is a tissue reaction in the form of fibrosis around that dust particle which are called opacities or nodules appearing as white dots/spots in Chest X-Ray Films.

Diagnosis and severity of disease is judged by the **size and distribution** of these white dots/spots.

They are compared by standard X-ray plates.

SIZE of White Dots/Spots (Opacities)

Small Dots/Spots (Less than 10mm)

Well defined

‹ 1.5 mm	Diameter referred to as p
1.5-3 mm	Diameter referred to as q
3-10 mm	Diameter referred to as r

Irregular net-like

‹ 1.5 mm	Diameter referred to as s
1.5-3 mm	Diameter referred to as t
3-10 mm	Diameter referred to as u

Small Dots/Spots (More than 10mm) which are further classified according to size as

Category A
Category B
Category C

Distribution of white Dots/Spots (Profusion)

As per distribution of small white dots/Spots in the Chest X-Ray film they are numbered as

Category 0
Category 1
Category 2
Category 3

And a 12 point scale is drawn up.

As per the ILO classification the Quality of X-ray is also commented upon.

ANNEXURE-VII List of Names and addresses of persons who have died because of silicosis in 21 Villages.

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
1	Hemata S/O Khaludiya	Dhayana (Bamana Phaliya)	50	M	9	Kumar, Godhra	Dead, 2002
2	Poti W/O Khaludiya	Dhayana (Bamana Phaliya)	65	F	9	Kumar Godhra	Dead, 2001
3	Joriya S/O Chaganiya	Dhayana (Kalacha Phaliya)	35	M	12	Akil Mines Godhra	Dead, 2001
4	Rejali D/O Chaganiya	Dhayana (Kalacha Phaliya)	20	F	12	Akil Mines Godhra	Dead, 2001
5	Gobariya S/O Nurja	Dhayana (Bahadi Phaliya)	35	M	4	Akil Mines Godhra	Dead 2006
6	Dhanaka S/O Jirama	Dhayana (Bamana Phaliya)	28	M	9	Kumar Godhra	Dead 2005
7	Lacha S/O Alsingh	Dhayana (Kalacha Phaliya)	29	M	6	Diamond Godhra	Dead 2004
8	Raisingh S/O Ramsingh	Dhayana (Bahadi Phaliya)	40	M	6	Kumar Godhra	Dead 2004
9	Undali D/O Dhansingh	Dhayana (Kalacha Phaliya)	25	F	4	Diamond Godhra	Dead 2003
10	Resla S/O Narlya	Dhayana (Bamana Phaliya)	30	M	9	Kumar Godhra	Dead 2003

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
11	Dasriya S/O Narlya	Dhayana (Bamana Phaliya)	25	M	9	Kumar Godhra	Dead 2003
12	Jamsingh S/O Jhendro	Dhayana (Bahadi Phaliya)	28	M	4	Kumar Godhra	Dead 2003
13	Jhanali W/O Tersingh	Dhayana (Bahadi Phaliya)	45	F	9	Kumar Mines	Dead 2002
14	Raju S/O Guliya	Dhayana (Bamana Phaliya)	16	M	4	Kumar Mines Godhra	Dead 2001
15	Mathariya S/O Dhuliya	Dhayana (Bahadi Phaliya)	45	M	10	Kumar Mines	Dead 2001
16	Kabali D/O Dhuliya	Dhayana (Bahadi Phaliya)	15	F	10	Kumar Mines	Dead 2001
17	Thavariya S/O Naikada	Dhayana (Bahadi Phaliya)	18	M	7	Kumar Godhra	Dead 2001
18	Saniya S/O Bhodra	Dhayana (Bamana Phaliya)	22	M	3	Kumar Godhra	Dead 2000
19	Somayadi D/O Jirama	Dhayana (Bamana Phaliya)	25	F	4	Kumar Godhra	Dead 2000
20	Mendali W/O Raysigh	Dhayana (Bamana Phaliya)	22	F	7	Diamond Godhra	Dead 2000
21	Ramki D/O	Dhayana (Bamana	20	F	7	Diamond Godhra	Dead 2000

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
	Manudiyo	Phaliya)					
22	Luli D/O Guliya	Dhayana (Bamana Phaliya)	18	F	4	Kumar Ind. Godhra	Dead 2000
23	Fodoriyo S/O Ratudiya	Dhayana (patel Phaliya)	20	M	5	Diamond Godhra	Dead 2000
24	Nachya S/O Sawala	Dhayana (Bahadi Phaliya)	22	M	4	Kumar Godhra	Dead 2000
25	Maju S/O Dhediya	Dhayana (Bahadi Phaliya)	30	M	9	Kumar Mines	Dead 2000
26	Regali D/O Dhuliya	Dhayana (Bahadi Phaliya)	20	F	10	Kumar Mines	Dead 2000
27	Fuljiya S/o Kuchiya	Dhayana (Bahadi Phaliya)	35	M	3	Akil Mines Godhra	Dead 2000
28	Khapri D/O Hamir	Dhayana (Bahadi Phaliya)	25	F	4	Akil Mines Godhra	Dead 2000
29	Raysingh S/O Manudiyo	Dhayana (Bamana Phaliya)	25	M	7	Diamond Godhra	Dead 1999
30	Maniya	Dhayana (Bahadi Phaliya)	48	M	9	Kumar Mines	Dead 1999
31	Samado S/O Ragha	Dhayana (Bamana Phaliya)	20	M	5	Kumar Ind. Godhra	Dead 1999
32	Malu S/O	Dhayana	30	M	8	Akil Mines	Dead

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
32	Malu S/O Bhadudiya	Dhayana (Bahadi Phaliya)	30	M	8	Akil Mines Godhra	Dead 1998
33	Kurban S/O Kagariya	Dhayana (Bahadi Phaliya)	35	M	9	Kumar Mines	Dead
34	Humla S/O Kagariya	Dhayana (Bahadi Phaliya)	20	M	9	Kumar Mines	Dead
35	Rongalo S/O Kagariya	Dhayana (Bahadi Phaliya)	18	M	9	Kumar Mines	Dead
36	Dulesingh S/O Bhimsingh	Dhayana (Bamana Phaliya)	45	M	6	Akil Mines Godhra	Dead
37	Guljya S/O Ratudiya	Dhayana (patel Phaliya)	16	M	6	Bharat, Godhra	Dead
38	Serdi W/O Dakuliya	Dhayana (Bahadi Phaliya)	33	F	6	Godhra	Dead
39	Bitiliya S/O Inderiya	Roradha (Khali Phaliya)	28	M	8	Jyoti,Godhra	Dead.3.4.05
40	Patali D/O Remala	Roradha (Babadev Phaliya)	15	F	10	Gayatri, Jyoti	Dead 8.6.03
41	Santi D/O Narsingh	Roradha (Babadev Phaliya)	15	F	8	Gayatri Balasinor	Dead 6.5.04
42	Chagan S/O	Roradha (Babadev	22	M	6	Gayatri Balasinor	Dead 4.7.03

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
	Surala	Phaliya)					
43	Kanaki S/O Khumsingh	Roradha (Babadev Phaliya)	40	M	5	Gayatri Balasinor	Dead 31.07.03
44	Surma D/O Harala	Roradha (Babadev Phaliya)	20	F	7	Gayatri Balasinor	Dead 28.07.05
45	Remsingh S/O Valsingh	Roradha (Babadev Phaliya)	17	M	8	Gayatri Balasinor	Dead 27.02.05
46	Remala S/O Rataniya	Roradha (Babadev Phaliya)	30	M	10	Gayatri, Jyoti	Dead 23.7.03
47	Jipal S/O Gumnya	Roradha (Babadev Phaliya)	15	M	5	Gayatri Balasinor	Dead 23.12.04
48	Keru S/O Bhangada	Roradha (Babadev Phaliya)	18	M	4	Gayatri Balasinor	Dead 23.06.03
49	Harliya S/O Kuliya	Roradha (Babadev Phaliya)	45	M	7	Gayatri Balasinor	Dead 23.04.05
50	Bhina D/O Narsingh	Roradha (Babadev Phaliya)	14	F	8	Gayatri Balasinor	Dead 21.12.04
51	Bhukaliya S/O Gujariya	Roradha (Dhondani Phaliya)	15	M	4	Jyoti,Balasinor	Dead 20.07.06
52	Sani W/O Bitiliya	Roradha (Khali Phaliya)	26	F	8	Jyoti,Godhra	Dead 19.09.03
53	Manibai	Roradha	28	F	10	Gayatri,	Dead

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
	Remala	Phaliya					
54	Remtiya S/O Khumala	Roradha (Bahadi Phaliya)	35	M	8	Jyoti, Godhra	Dead 12.10.03
55	Duragi W/O Kaliya	Roradha (Khali Phaliya)	32	F	8	Jyoti, Godhra	Dead 10.09.03
56	Radtiya S/O Gujariya	Roradha Dhndani Phaliya	24	M	4	Jyoti, Balasinor	Dead 09.10.04
57	Bhursingh S/O Bhangada	Roradha Babadev Phaliya	16	M	4	Gayatri Balasinor	Dead 08.06.0[illegible]
58	Ramali D/O Ratan	Roradha Babadev Phaliya	25	F	10	Gayatri, Jyoti	Dead 05.08.0[illegible]
59	Ringanya S/O Jamsingh	Roradha Dhndani Phaliya	35	M	9	Gayatri Balasinor	Dead
60	Kaliya S/O Sekadiya	Roradha (Khali Phaliya)	35	M	8	Jyoti, Godhra	Dead
61	Gopal S/O Karamsingh	Roradha (Khali Phaliya)	14	M	8	Jyoti, Godhra	Dead
62	Bhangadi D/O Karamsingh	Roradha Dhndani Phaliya	16	F	8	Jyoti, Godhra	Dead
63	Mangala S/O Tetiya	Bholwat (Ujadiya Phaliya)	40	M	8	Kumar Godhra	Dead 1997

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Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
64	Juwansingh S/O Narliya	Bholwat (Ujadiya Phaliya)	40	M	5	Kumar Godhra	Dead 2006
65	Kendalsingh S/O Narliya	Bholwat (Ujadiya Phaliya)	45	M	5	Kumar Godhra	Dead 2005
66	Bijla S/O Harliya	Bholwat (Ujadiya Phaliya)	25	M	5	Kumar Ind Godhra	Dead 2003
67	Amita W/O Bijala	Bholwat (Ujadiya Phaliya)	24	F	5	Kumar Godhra	Dead 2003
68	Mendali D/O Kadariya	Bholwat (Ujadiya Phaliya)	10	F	9	Kumar Mines	Dead 2003
69	Mendali D/O Nuraja	Bholwat (Ghaman Phaliya)	20	F	3	Shivshakti Mines	Dead 2002
70	Kadriya S/O Bahadur	Bholwat (Ujadiya Phaliya)	58	M	9	Kumar Mines	Dead 2002
71	Samadi D/O Ratudiya	Bholwat (Ujadiya Phaliya)	32	F	8	Kumar Mines	Dead 2002
72	Bahadur S/O Kadariya	Bholwat (Ujadiya Phaliya)	30	M	9	Kumar Mines	Dead 2001
73	Khumsingh S/O Hiraliya	Bholwat (Ujadiya Phaliya)	38	M	9	Kumar, Akil	Dead 2001
74	Pemla S/O Jadudiya	Bholwat (Ujadiya	43	M	4	Kumar Godhra	Dead 2001

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	When happened & when it happened
	Jadudiya	(Ujadiya Phaliya)				Godhra	2001
75	Narliya S/O Dhana	Bholwat (Ghaman Phaliya)	30	M	10	Kumar Godhra	Dead 2000
76	Dhuda S/O Ratudiya	Bholwat (Ujadiya Phaliya)	37	M	10	Akil Mines Godhra	Dead 2000
77	Gendali D/O Kadariya	Bholwat (Ujadiya Phaliya)	12	F	9	Kumar Mines	Dead 2000
78	Sevla S/O Hirliya	Bholwat (Ujadiya Phaliya)	40	M	9	Kumar, Akil	Dead 2000
79	Jamsingh S/O Hiraliya	Bholwat (Ujadiya Phaliya)	42	M	9	Kumar, Akil	Dead 2000
80	Ghugari W/O Sumala	Bholwat (Ujadiya Phaliya)	50	F	8	Kumar Mines	Dead 2000
81	Remla S/O Jadudiya	Bholwat (Ujadiya Phaliya)	55	M	9	Kumar Godhra	Dead 1999
82	Sevala S/o Irala	Bholwat (Ujadiya Phaliya)	38	M	4	Kumar Godhra	Dead 1999
83	Naikda S/O Narlya	Bholwat (Ujadiya Phaliya)	45	M	8	Kumar Godhra	Dead 1999
84	Ranglo S/O Jadudiya	Bholwat (Ujadiya Phaliya)	22	M	9	Kumar Godhra	Dead 1998

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
85	Goahayadi W/O Mangala	Bholwat (Ujadiya Phaliya)	35	F	8	Kumar Godhra	Dead 1997
86	Ida S/O Thawariya	Malawai (Bayadi Phaliya)	30	M	6	Gayatri Godhra	Dead
87	Kali W/O Ida	Malawai (Bayadi Phaliya)	28	F	6	Gayatri Godhra	Dead
88	Antariya S/O Bhangadiya	Malawai (Bayadi Phaliya)	30	M	9	Jyoti Balasinor	Dead
89	Santap S/O Kharasiya	Malawai (Bayadi Phaliya)	26	M	9	Jyoti Balasinor	Dead
90	Temariya S/O Bhangadiya	Malawai (Bayadi Phaliya)	26	M	9	Jyoti Balasinor	Dead
91	Mehtab S/O Westa	Malawai (Bayadi Phaliya)	35	M	10	Jyoti Balasinor	Dead
92	Gujali W/O Mehtab	Malawai (Bayadi Phaliya)	33	F	10	Jyoti Balasinor	Dead
93	Relu w/o Kaliya	Malawai (Bayadi Phaliya)	28	F	10	Jyoti Balasinor	Dead
94	Gujala S/O Chotu	Malawai (Kurchapli Phaliya)	30	M	9	Jyoti Balasinor	Dead
95	Lalbai W/O	Malawai (Kurchapli	27	F	9	Jyoti Balasinor	Dead

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
	Gujala	Phaliya)					
96	Kekadiya S/O Partya	Malawai (Holi Phaliya)	20	M	2	Jyoti Balasinor	Dead
97	Ramsingh S/O Ditaliya	Malawai (Bayadi Phaliya)	25	M	10	Jyoti Balasinor	Dead
98	Dhukali W/O Ramsingh	Malawai (Bayadi Phaliya)	22	F	10	Jyoti Balasinor	Dead
99	Runbai D/O Ramsingh	Malawai (Bayadi Phaliya)	6	F	10	Jyoti Balasinor	Dead
100	Chomariya S/O Bhurala	Malawai (Bayadi Phaliya)	20	M	4	Jyoti, Gayatri	Dead
101	Kaliya S/O Chamariya	Malawai (Bayadi Phaliya)	48	M	6	Jyoti Balasinor	Dead
102	Jagariya S/O Walsingh	Malawai (Bayadi Phaliya)	35	M	9	Jyoti Balasinor	Dead
103	Geeta W/O Sumariya	Malawai (Bayadi Phaliya)	38	F	5	Jyoti Balasinor	Dead
104	Narpat S/O Kandiya	Malawai (Bayadi Phaliya)	30	M	9	Jyoti Balasinor	Dead
105	Sumariya S/O Jirala	Malawai (Bayadi Phaliya)	40	M	7	Gayatri Godhra	Dead
106	Ghamari	Malawai	15	F	7	Gayatri	Dead

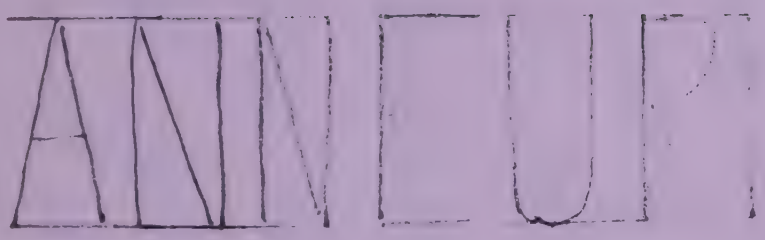
Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
	D/O Sumariya	(Bayadi Phaliya)				Godhra	
107	Guddu S/O Khumsingh	Ghogasa (Wavadi Phaliya)	18	M	9	Gayatri Balasinor	Dead20. 6.03
108	Chamayadi Widow/O Dhansingh	Ghogasa (Wavadi Phaliya)	55	F	8	Jyoti,Balas inor	Dead15.0 5.03
109	Mamata D/O Bherala	Ghogasa (Wavadi Phaliya)	14	F	10	Gayatri Balasinor	Dead Nov,04
110	Sangu D/O Bhavsingh	Ghogasa (Wavadi Phaliya)	15	F	10	Gayatri Balasinor	Dead 6.5.03
111	Relma W/O Kaliya	Ghogasa (Wavadi Phaliya)	18	F	9	Gayatri Balasinor	Dead 30.6.03
112	Manibai W/O Temriya	Ghogasa (Wavadi Phaliya)	30	F	8	Jyoti,Balas inor	Dead 28.10.03
113	Mangalibai W/O Bhavala	Ghogasa (Wavadi Phaliya)	28	F	4	Jyoti, Gayatri	Dead 25.8.03
114	Rakesh S/O Bhavsingh	Ghogasa (Wavadi Phaliya)	7	M	10	Gayatri Balasinor	Dead 25.5.03
115	Selbai W/O Temriya	Ghogasa (Wavadi Phaliya)	38	F	8	Jyoti,Balas inor	Dead 25.10.03
116	Kaliya S/O Khumsingh	Ghogasa (Wavadi Phaliya)	22	M	9	Gayatri Balasinor	Dead 2.6.03

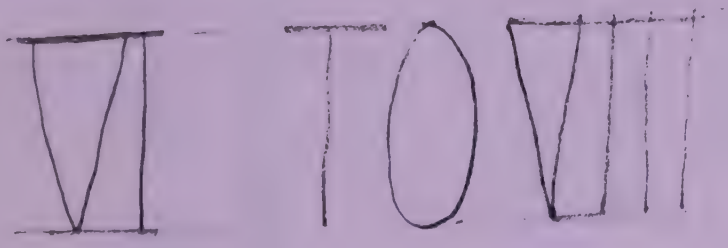
·. o	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happene & when happene
7	Temriya S/O Dhansingh	Ghogasa (Wavadi Phaliya)	40	M	8	Jyoti,Balas inor	Dead 15.10.03
8	Ganesh S/O Temriya	Ghogasa (Wavadi Phaliya)	16	M	8	Jyoti,Balas inor	Dead 15.04.0
9	Relu W/O Guddu	Ghogasa (Wavadi Phaliya)		F	9	Gayatri Balasinor	Dead
0	Ithala S/O Dhedu	Ghogasa (Wavadi Phaliya)	48	M	9	Jyoti, Gayatri	Dead
1	Sanibai D/O Ithala	Ghogasa (Wavadi Phaliya)	18	F	9	Jyoti, Gayatri	Dead
2	Kamali W/O Ditliya	Ghogasa (Wavadi Phaliya)	40	F	7	Jyoti, Gayatri	Dead
3	Dewala S/O Ditliya	Ghogasa (Wavadi Phaliya)	25	M	7	Jyoti, Gayatri	Dead
4	Ditliya S/O Raisingh	Ghogasa (Wavadi Phaliya)	43	M	7	Jyoti, Gayatri	Dead
5	Jhendi W/O Bhursingh	Indarsingh Choki	50	F	8	Gayatri, Godhra	Dead 2006
6	Bhirlya S/O Narsingh	Indarsingh Choki	35	M	7	Gayatri, Godhra	Dead 2006
7	Hiri W/O Bhursingh	Indarsingh Choki	45	F	8	Gayatri, Godhra	Dead 2005

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
128	Dursingh S/O Narsingh	Indarsingh Choki	32	M	7	Gayatri, Godhra	Dead 2004
129	Ramli W/O Dursingh	Indarsingh Choki	30	F	7	Gayatri, Godhra	Dead 2004
130	Sursingh S/O Westa	Indarsingh Choki	26	M	6	Gayatri, Godhra	Dead 2003
131	Kadu S/O Bahadur	Indarsingh Choki	25	M	3	Gayatri, Godhra	Dead 2003
132	Vesta S/O Surala	Indarsingh Choki	26	M	6	Gayatri, Godhra	Dead 2003
133	Bahadur S/O Westa	Indarsingh Choki	60	M	3	Gayatri, Godhra	Dead 2001
134	Ramesh S/O Bhuna	Rampura	28	M	15	Uma, Balasinor	Dead June 06
135	Kamalsingh S/O Bhangu	Rampura	18	M	9	Uma, Balasinor	Dead 2005
136	Durbai W/O Moti	Rampura	30	F	15	Uma, Balasinor	Dead 2004
137	Rama S/O Bhuna	Rampura	22	F	15	Uma, Balasinor	Dead 2004
138	Vesta S/O Bhangu	Rampura	22	M	9	Uma, Balasinor	Dead 2003
139	Mehari W/O Westa	Rampura	20	F	9	Uma, Balasinor	Dead 2003
140	Bhuri D/O Westa	Rampura	7	F	9	Uma, Balasinor	Dead 2003
141	Sayada	Rampura	10	F	9	Uma,	Dead

	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happened & when it happened
	W/O Westa					Balasinor	2003
0	Bhuri D/O Westa	Rampura	7	F	9	Uma, Balasinor	Dead 2003
1.	Sayada D/O Bhangu	Rampura	10	F	9	Uma, Balasinor	Dead 2003
2	Reshmabai S/O Parsingh	Ambari faliya mebar	28	F	10	Uma, Balasinor	Dead 2006
3	Idu S/O Nanalya	Ambari faliya mebar	18	M	5	Gayatri Godhara	Dead 2005
4	Kani S/O Rupsingh	Ambari faliya mebar	25	M	4	Gayatri Godhara	Dead
5	Vesta S/O Jhetra	Ambari faliya mebar	18	M	2	Gayatri Godhara	Dead
6	Indriya S/O Patlya	Ambari faliya mebar	45	M	4	Gayatri Godhara	Dead
7	Asma s/o Mansingh	Ambari faliya mebar	38	M	11	Gayatri Godhara	Dead
8	Gouri W/O Devtiya	Deepa ke choki	30	F	3	Gayatri	Dead 2005
9	Balga S/O Dewala	Deepa ke choki	20	M	3	Gayatri	Dead 2000
0	Satu s/o Juwnsingh	Morasa, Takur	22	M	4	National Godhra	Dead 11july

Sr. No	Name of Affected person	Village	Age	Sex	No. family members	Name of Factory & address	What happen & wher happen
		Phaliya					2006
151	Mukam S/O Westa	Morasa, Takur Phaliya	30	M	13	National Godhra	Dead
152	Anudiyo S/O Mehato	Khamedaka	35	M	11	Kumar Godhra	Dead 2003
153	Mehato S/O Maniya	Khamedaka	65	M	11	Kumar ind. Godhra	Dead 2004
154	Khalu S/O Kekadiya	Thana Sembali	35	M	6	Gayatri, Godhra	Dead 2004
155	Relu W/O Khalu	Thana Sembali	30	F	6	Gayatri, Godhra	Dead
156	Mukesh S/O Magan	Chanpur, Aagalgota	21	M	8	Saharam, Jalaram	Dead
157	Kadu S/O Sekadiya	Behadava (Semali Phaliya)	18	M	9	Jyoti Godhra	Dead 4/07/0
158	Kutriya S/O Remaja	Gadat	20	M	2	Kumar Godhra	Dead 2004





-श्रीमान
तहसीलदार महोदय
तह० आसोदजुर

विषय :- गुजरात राज्य में टीएल फैक्ट्री में काम करते के दौरान बिमारी से प्रभावित मजदूरों के स्वास्थ्य परीक्षण की सूची बनाना

महोदय विनम्रतापूर्वक,

गुजरात राज्य में टीएल फैक्ट्रियों में काम करते हुए दौरान कई मजदूर बिमार हो गये हो। जिन्हें फेफड़ों तकलीफ के साथ खांसी आना, वजन कम होना, आदि की शिकायत थी।

मजदूरों का स्वास्थ्य परीक्षण

ANNEXURE - [illegible]

किया गया है।

सभी मजदूरों की सूची संलग्न है।

श्रीमान की ओर प्रेषित।

सभी मरीजों की जाँच 11/8/05 से 20/8/05 के मध्य सिविल हास्पिटल आलीराजपुर में की गयी है।

13/9/05

Dr. P. Dholce
MD
M.O. Civil Hospital
Aliraj

ग्राम :- धौंडासा

S.NO	OPD NO	नाम (पिता / पति)	उम्र	पता	डायग्नोसिस by x Ray chest
1.		गणेश / टेमरा	20 yrs m	धौंडासा	Silico T.B.
2.	26586	रमेश / दितलिया	134 m	आदड़ी फ०	Silico T.B.
3.	26585	कमली w/o दितलिया	50 yrs f	—11—	—11—
4.	26582	लसँती w/o मातात	28 yrs f	—11—	Silico T.B.
5.	2943x	कौन्री D/o इडला	22 yrs f	—11—	Silicosis
		ग्राम :- इन्दरसिंग चौंडी			
1.	26662	इँदी w/o भूरसिंग	35 yrs f	इन्दरसिंग चौंडी	Silicosis
2.	26654	भेरला / नानसिंग	22 yrs m	—11—	Silicosis

ग्राम मालतई

	OPD NO	नाम (पिता / पति)	उम्र	पता	डायग्नोसिस by xRay chest
1.	26490	गुजलिया / मानलाल	40/cm	पोरल फ०	— (N)
2	26498	सुमारिया / सुरपाल	25/m	पोरल फ०	— NAD
3.	26497	रागलिया / गुजरिया	18/m	झुझका फ०	Silicosis + Pulmonary Tuberculosis
4.	26496	F हिंगली w/o गुजरिया	35/F	झुझका फ०	— NAD
5	26500	F रूपली / सुरपाल	50/m	—11—	SilicoTuberculosis
6	26499	F गुजली w/o नेतराम	30/F	—11—	—11—
7	26510	नेतराम / वेल्ला	10/m	—11—	—11—
8	26507	नरपत / कंडिया	20/m	—11—	—11—
9.	26528	F गमकाई w/o वेल्ला	60/F	—1—	—
10	26509	F अन्तर पिता रतरिया	18/F	—	SilicoTuberculosis
11	— —	छोटू / मनिया	30/m	पोरल फ०	Silicosis
12	26514	F भँगड़ी w/o छोटू	30/F	आलवई	— NAD

13	26715	सिकड़िया / छोटू	1m/m	मालंड	N.A.D
14	26720	बिरजा w/o रामला	35 yrs	-11-	Silicosis
15	26719	इसराम / रामल	1m4m	-11-	N.A.D
16	--	चूनी w/o कालिया	35 yrs	-11-	Silico T.B.
17	27341	रामला / धातरिया	4m/m	-11-	- Silico T.B.
18	27318	कालिया / चमारिया	38yrs	-11-	mild. Silicosis
19	28781	कालिया / भलसिंग	50yrs	पोलिस	Silicosis (mild)

Dr. P. Dutta
IMO

ग्रुप रोड़धा

	OPD NO	नाम (लिंग / पति)	उम्र	पता	सिलिकोसिस / TB / Resp.
1.	26486	झेंडु / गंगड़ा	20 yrs	पड़ेल फ	Silicosis
2.	26488	लुंतरसिंग / केसरिया	30 yrs	रोड़धा	NAD
3.	26491	शुकलिंगा / गुजरिया		-11-	Silico T.B.
4.	26489	खेचा / कुलिया	30 yrs	-11-	Silico T.B.
5.	26536	जुतानसिंग / हरलिंगा	15 yrs	-11-	NAD
6.	-	रिंगलिंगा / जामसिंग	30 yrs	-11-	Silicosis
7	26538	नानलिंगा	25 yrs	पड़ेलफ	- mild Eff. of Silicosis
8	26537	फालिंगा / सेकड़िया	35 yrs	-11-	Silicosis
9	-	काहलीय० खेचा	-	रोड़धा	mild Eff of Silicosis
10	26641	रेमसिंग / लालसिंग	20 yrs	पड़ेल फ	- Silico T.B.
11	26642	नरसिंग / जालम	40 yrs	-11-	Silicosis
12					

Government of West Bengal
Office of the superintendent, Belur E.S.I. (TB) Hospital
P.O. Sapuipara (Bally), Howrah, PIN-711227

Memo No: ESI / BEL / 1742 Date: 28/7/06

To
Dr G.D.Verma / Dr Ashish Gupta,
SHILPI KENDRA,
22, Shanti Nagar, Shrinagar Ext.,
Indore, Madhya Pradesh.

Sub: ILO Rating of CXR plates sent by you
(16 plates in total) of suspected Silicotics.

Ref: Your No N I L, dated the14th June 2006.

ANNEXURE - VII

Dear Doctor,

Thanks for sending the Chest X-Rays of suspected Silicosis victims for ILO Rating at this institute for organized sector of workers covered under ESI Act. We also extend our heartfelt thanks to your organization for taking up the cause of such poor workers not having the basic of workers rights.

Firstly this is to be clarified that, Silicosis is a disease where the diagnosis is to be made based on (a) Occupational History of exposure to Active Silicate at work place and

is considered by all workers in the field of occupational health as the only diagnostic tool needed for diagnosing Silicosis.(Ref: Diagnostic Criteria for Occupational Diseases. PRIA,). Spirometry done by you in the present group is only relevant, if there is question of assessment of impairment / disability for compensation. As Spirometry do not have any diagnostic value in Silicosis.

As regards recording of Occupational history in the present series, as done by you, appears to be inadequate. The workers being absolutely temporary in nature and supposed absence of records of such workers being engaged, the respondents in your study probably have given working history only for the PRESENT employment, whereas he /she may have been working at other sites getting the exposure. This may please be excluded; as many a CXR shows signs of either prolonged exposure or very heavy exposure to active dust.

I am enclosing below the 'ILO Rating' of the X-Rays sent by you;-

(CXR s were rated by three independent reader using ILO International Classification of Radiographs of Pneumoconioses, Revised Ed, 1980. The mean rating of the three readers is tabulated below. Symbols used are as per the above reference)

Sl. No.	Name	CXR ID	ILO Rating
01	Bhukhia	R928	3/3, r/q, ax in RMZ LMZ RLZ, ih , Relative sparingUZ
02	Kamli	R912	3/2, q/q, ax in LUZ LMZ
03	Rangli	R916	3/3, r/r, ob-Blunt CP angles, ih, ax-all zones.
04	Ramlu	R910	3/2, q/q, A-LUZ,ax-LUZ LMZ RUZ. Hila drawn up.
05	Gumbai	R914	X-Ray unacceptable quality for ILO rating
06	Nawal Singh	R919	0/1, p/p.
07	Birju	R911	0/0, tb- LUZ LMZ.
08	Chandy	R922	0/0.
09	Sajan Singh	R925	3/3, q/q.
10	Sedia	R917	3/3, q/r, ax-RUZ RMZ LUZ LMZ, px-Lt upper + mid zone
11	Kekdia	R921	X-Ray unacceptable quality for ILO rating *(1)
12	Jhendu	R918	2/1, r/q, A-LUZ, ax- RU RM LU &LMZ, tb-RUZ LUZ
13	Suni	R913	X-Ray unacceptable quality for ILO rating * (2)
14	Rukhali	R915	X-Ray unacceptable quality for ILO rating
15	Karam Singh	R929	X-Ray unacceptable quality for ILO rating
16	Sewal Singh	R930	X-Ray unacceptable quality for ILO rating * (3)

*(1) Deep over exposed, suggestive of 2/2, r/r.

*(2) Poor X-Ray, suggestive of q/q, 3/2.

(profusion above 1/1 for small regular opacities like 'p''q'&'r' along with Occupational history of exposure to active dust is considered diagnostic for dust related Occupational Lung Disease like SILICOSIS)

As apparent from above table, out of 16 CXRs rated, 5 are of poor quality, and out of rest 11 CXRs 7(seven) are found to have ILO rating commensurate with diagnosis of SILICOSIS, provided the subjects have definite exposure to active silica dust.

Hope that the above report will be of some use to you, in your effort to protect the poor workers from further Occupational Hazards and also to establish their cases.

Please feel free to seek any clarification, if needed.

Yours truly,

28/7/02

(Kunal Kumar Datta)
M.O. in Charge, Occupational Disease Detection Center,
and Medical Superintendent,
E.S.I.Hospital, Belur, West Bengal.

राष्ट्रीय व्यावसायिक स्वास्थ्य संस्थान

NATIONAL INSTITUTE OF OCCUPATIONAL HEALTH

(WHO Collaborative Centre for Occupational Health & IPCS Participating Institute)

(Indian Council of Medical Research)

Meghani Nagar, Ahmedabad-380 016, India

RRT/Silicosis/Zhalod/2004/518

03 December 2004

To,

Dr. Amarjit Singh,

Secretary (Family Welfare) and Commissioner.

Commissionerate of Health,

Medical Services, Medical Education and Research,

Government of Gujarat,

Block No. 4,

Dr. Jivraj Mehta Bhavan,

Gandhinagar-382010

FAX NO. 079-23256430

Subject: Regarding report of the health survey at Zhalod.

ANNEXURE-VII

Please find enclosed herewith the reports of the workers examined during the quick health survey carried out at Community Health Centre, Zhalod from 26-27th October 2004 for necessary action. As per the requirements of Indian Factories Act, I am also sending a copy to the Chief Factories Inspector.

With regards

Yours sincerely,

HN Saiyed
Director

Encl: Reports of Dahod cases and Zhalod cases

Phone : (PBX) (91) 79-268 6351, 268 6352, 268 6359, 268 6237, 268 6430, 268 6330, 268 6242

DETAILS OF THE CLINICAL AND RADIOLOGICAL FINDINGS OF THE SEVEN SUSPECTED CA

Sl. No.	Name	Age	Sex	Exposure (in yrs)	Smoking History	Cough (Duration in months)	Crepths/ Rhonchi	PFVC	FVC (in litres)	PFEV1
1	Kashubhai D Damor	37	M	1	Chronic Smoker	8 m	-	3.85	1.48	3.35
2	Javlabhai M Bhitwad	35	M	1	Chronic Smoker	2 m	-	Not given	Not given	Not given
3	Zukhobhai S Damor	35	M	1	Chronic Smoker	8 m	-	3.67	2.63	3.22
4	Mangubhai S Damor	26	M	1	Not mentioned	4 m	-	3.95	2.25	3.59
5	Shailesh S Damor	17	M	1	Not mentioned	4 m	-	3.86	1.44	3.61
6	Nandubhai S Damor	32	M		Not mentioned	3 m	-	3.89	1.67	3.46
7	Subhash S Damor	25	M	1	Chronic Smoker	3 m	-	4.22	2.52	3.84
8	Fakirabhai	NA	M	NA	NA	NA	NA	NA	NA	NA

NA= Not Available

SES OF SILICOSIS FROM DAHOD

FEV1 (litres/ sec)	FEV1/F VC	PEFR (litres/ sec)	PFT STATUS	X-ray Diagnosis	ILO Classification of X-ray	Comments
1.4	115	2.88	Combined	Bilateral Upper and Mid Zone reticulo-endothelial pattern. Right lower lobe shows well defined solitary pulmonary nodule in right paracardiac region. Both CP angle clear.	2.2 q.q TB both lung field.	Silico-tuberculosis
Not given	Not given	Not given	Can't comment	Both Lung fields Normal. Both CP angle clear	Hilargland enlargement bilateral.	Blurred film adv Rpt.
2.02	93	4.44	Combined	Fibronodular opacities in upper lobes of both lung fields.	2.2 q.q TB BUZ.	Silicosistuberculosis
1.92	100	4.18	Combined	Bilateral extensive nodular-fibrotic opacities more on Left side. Changes of emphysema on left side. Both CP angles clear.	2.2 q.q TB both lung field.	Silicosistuberculosis. Underdeveloped and blurred film Adv rpt.
1.21	97	4.59	Combined	Fibro-nodular opacities in both upper and mid zone	1.1 p.q TB BUZ. Hilarglandenlargeme nt bilateral	silicotuberculosis.
1.67	119	6.36	Combined	Bilateral extensive reticulonodular opacity. More in mid zones with relative sparing of base and peripheral lung. Right hilum appears prominent. Both CP angles clear.	3 3 q.q	silicosis.
2.36	109	4.67	Combined	Fibro-nodular opacity in both upper lobe.	1.1 q.q TB BUZ. Hilargland enlargement bilateral	silicotuberculosis.
NA	NA	NA	NA	NA	2.2 p.p TB Rt UMZ. Hilargland enlargement bilateral.	silicotuberculosis.

REPORT OF ZHALOD

	Name	Age	Sex	Facotry	Address	Smoking	Duration of exposure (months)	Past H/o TB	Height (cm)
	Vasantlal Badiyabhai Babhor	30	M	Badri	Mandlikhota	Non-smoker	12	No	156
	Gokal Jagji Babhor	50	M	Badri	Mandlikhota	Smoker	12	No	155
	Gaur Metia Kamod	44	M	Not mentioned	Mandlikhota	Smoker	2	No	166
	Ramsu Lalla Babhor	50	M	Not mentioned	Mandlikhota	Non-smoker	4	No	159
	Naresh Vasant Babhor	18	M	Not mentioned	Mandlikhota	Non-smoker	60	No	154
	Dinesh Fatta Kamod	21	M	Badri	Kharsana	Non-smoker	12	Yes	167
	Kamila Fatta Kamod	20	F	Badri	Kharsana	Non-smoker	6	No	157
	Chiman Lathya Kamod	35	M	Bharat	Kharsana	Ex-Smoker	4	Yes	172
	Kadua Hadiya Kamod	35	M	Bharat	Kharsana	Non-smoker	24	Yes	163
	Narsing Hadiya Kamod	30	M	Bharat	Kharsana	Non-smoker	24	No	173
	Navalsingh Makan Alid	20	M	Not mentioned	Godiya	Non-smoker	1	No	163
	Danubhai Sadiyabhai Kamod	36	M	Bharat	Kharsana	Non-smoker	24	Yes	164
	Harisingh Kuvrabhai Kamod	48	M	Bharat	Kharsana	Non-smoker	24	Yes	175
	Maganbhai Khetabhai Kamod	29	M	Bharat and National	Kharsana	Non-smoker	18	No	159
	Sukhabhai Harjibhai Kamod	45	M	Bharat	Kharsana	Non-smoker	12	Yes	162
	Kantibhai Jawaharbhai Bilije	18	M	Badri	Mandlikhota	Non-smoker	12	No	159
	Nilesh shamji Bariya	18	M	Not mentioned	Munkhosla	Non-smoker	12	No	162
8	Ganjsingh Burkha Bariya	23	M	Badri	Munkhosla	Non-smoker	36	No	166
9	Anita Santu Bariya	20	F	Badri	Matkhola	Non-smoker	12	No	147
10	Bachubhai Sunlyabhai Damor	35	M	Hindustan	Chitrodiya	Non-smoker	4	Yes	163
11	Menaben Nadubhai Damor	30	F	Hindustan	Chitrodiya	Non-smoker	12	No	144
12	Pashua Chakana Garasiya	20	M	Badri	Therka	Non-smoker	12	No	162
13	Suresh Wagji Garasiya	18	M	Badri	Therka	Non-smoker	12	No	156
14	Ishwar Chakana Garasiya	19	M	Badri	Therka	Non-smoker	12	No	155

CASES

Weight (Kg)	Respiratory Auscultation	Abnormality on auscultation	ILO Classification of X-ray	Comment
40	Abnormal	Occasional crepts in Right Mid Zone	Fogging Advice Repeat	Advice repeat
40	Normal	Normal		
45	Normal	Normal	TB Lt UZ and Rt Hilar region.	TB
			NAD	Normal
47	Normal	Normal	NAD	Normal
37	Normal	Normal	NAD	Normal
43	Normal	Normal	2.2 q.q Ext TB both Lung Field.	SilicoTubercul
37	Normal	Normal	3.3 q.q	Silicosis
48	Normal	Normal	Fogging TB BUMZ Advice repeat X-ray	TB. Advice rep
40	Abnormal	Breath sounds reduced in Right Lower zone	3.3 p.p TB BUMZ. Silicosis Rt.	SilicoTubercul
50	Normal	Normal	3.3 q.q TB both lung field.	SilicoTubercul
44		Normal	Fogging TB Rt.UZ Advice repeat X-ray	TB . Advice re
55	Abnormal	Breath sounds reduced in RMZ and RLZ	1.1 p.p TB. BUMZ.	TB
58	Abnormal	Breath sounds reduced in left lower zone	2.2 q.q TB Lt lung field	SilicoTubercul
44	Normal	Normal	1.1 q.q	Silicosis
44	Abnormal	Breath sounds reduced in Left Mid Zone	1.1 q.q Hilar gland enlargement Bilateral.	Silicosis
55	Normal	Normal	NAD	Normal
57	Normal	Normal	NAD	Normal
	Normal	Normal	NAD	Normal
	Normal	Normal	NAD	Normal
	Normal	Normal	3.3 p.q TB both lung field.	SilicoTubercu
	Normal	Normal	2.2 q.q	Silicosis
	Abnormal	Breath sounds decreased in RLZ	NAD	Normal
	Normal	Normal	Hilar gland enlragement bilateral	Hilar Gland e
	Normal	Normal	NAD	Normal

ANNEXURE-VIII:

List of Quartz Factories in Godra and Balasinore as per List Provided by Office of Factory Inspector Godra.

GODRA:

1. Sara Minerals And Chemicals Post Patpura Tehsil Godhra.
2. Bharat Silica Sand Chokdra Tehsil Godhra.
3. Raj Minerals,Bhamya, Tehsil Godhra.
4. Diamond Abrasive,Chakhodra, Tehsil Godhra.
5. National Minerals,Popatpura, Tehsil Godhra.
6. Silicon Minerals Corporation,Near Overbridge, Tehsil Godhra.
7. Yamunaji Minerals Corporation, Tehsil Godhra.
8. Quartz India, Lilasara, Tehsil Godhra.
9. Dhartidhan Minerals,Bhamya, Tehsil Godhra.
10. Hindustan Minerals,Bhamya, Tehsil Godhra.
11. Badri Minerals,Bhamya, Tehsil Godhra.
12. Kumar Industrial Corporation,GIDC, Tehsil Godhra.
13. Crystal India, Bhamya, Tehsil Godhra.
14. Mahesh Minerals,Bhamya, Tehsil Godhra.
15. Western Minerals,Bhamya, Tehsil Godhra.
16. Srinathji Quartz, Timba, Lunawada
17. Srinath Minerals, Panam Patiya, Lunawada.
18. Raj Minerals, Bahmaiya, Godhara
19. Elecon Minerals Corporation, Nr Overbridge, Godhara.

CLOSED FACTORIES:

1. Kumar Minerals Pvt Ltd, Tehsil Godhra
2. Jay Jalaram Minerals, Kalol (Bejalpur).
3. Vallabh Minerals Corporation, GIDC, Godra.
4. Minerva Products, Nevsaria, Tehsil Godhra
5. West Cost Minerals, GIDC, Godra.
6. Ganesh Stone Milling Industries, Gidc, Godra.
7. Panch Mahal Stone Milling Industries, Godra.

BALASINOR:

20. Quality Quartz, B-23, GIDC, Balasinor.
21. Hari Om Minerals, B-1/18, GIDC, Balasinor.
22. Swaraj Minerals, B-1/13, GIDC, Balasinor.
23. Srinathji Minerals, B-1/16, GIDC, Balasinor.
24. Uma Minerals, 39/40, GIDC, Balasinor.